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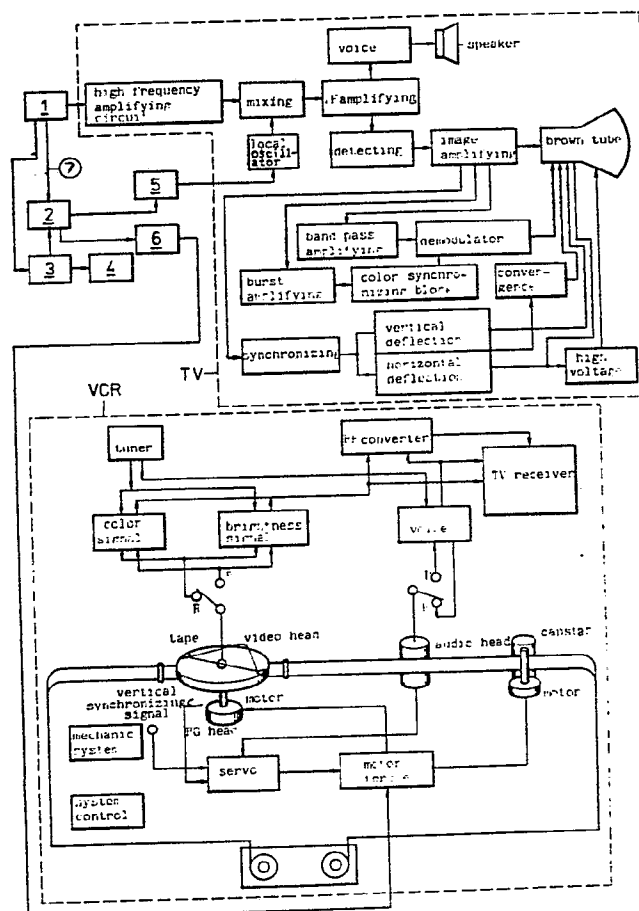
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(58) Field of search  
UK CL (Edition J) H3Q QBCT QCD QLCA  
INT CL<sup>4</sup> H03J, H04N

## (54) **Apparatus for controlling video or audio equipment**

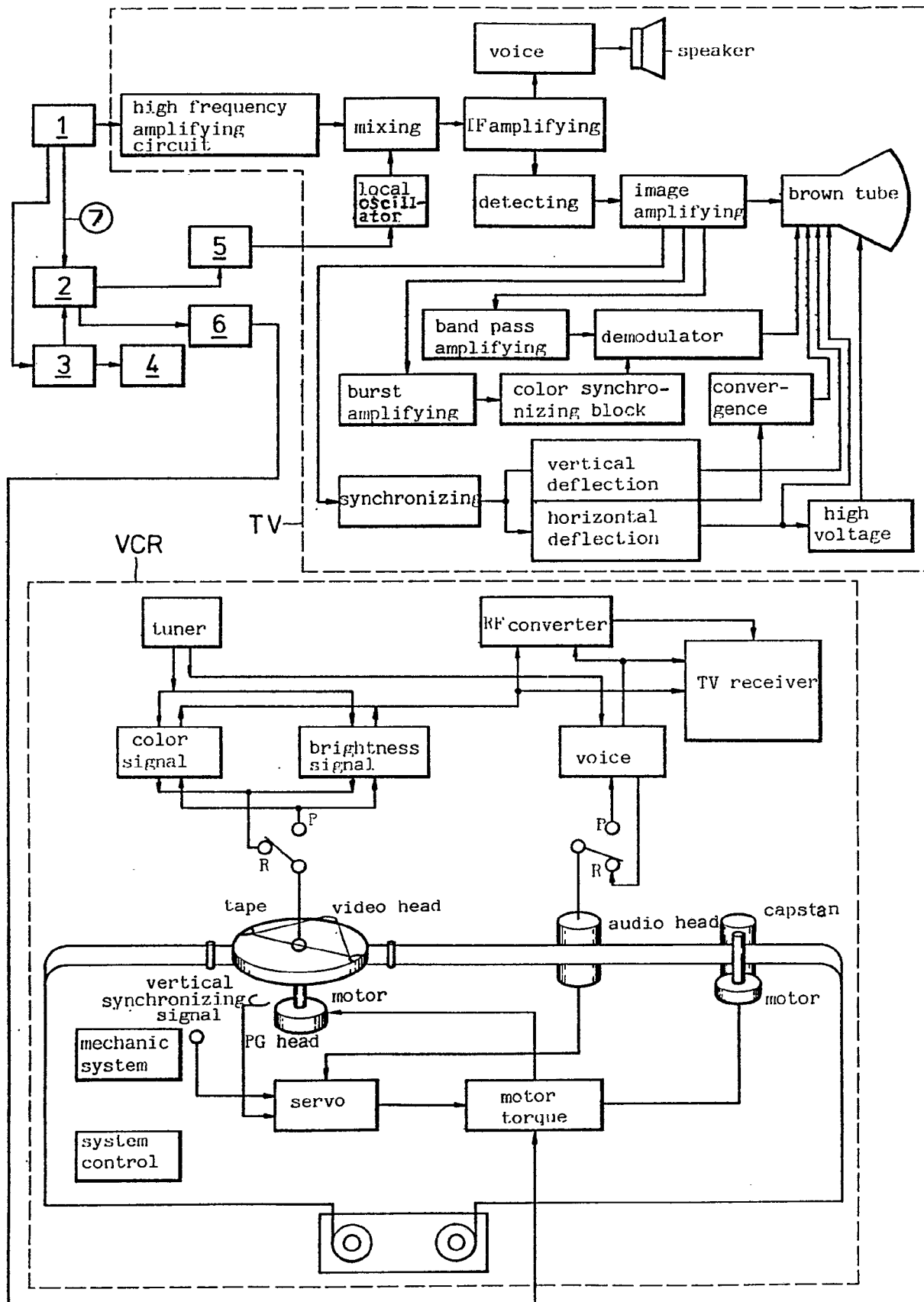
(57) The apparatus includes detecting means (1) which detects types of TV or radio programmes currently being broadcast on various channels or stations, storage and selecting means (2) storing preference information on types of programme preferred by a user and operable to select a particular channel or station based on that information, and tuning means (5) which causes a connected TV, radio, video or audio recorder to receive that channel or station. Display means (3,4) can also be provided for displaying the types of programme currently available. In addition, a control circuit (6) can be provided for initiating recording by a video or audio recorder. The apparatus can detect, amongst other types of programmes, commercials and can switch channels temporarily during the commercials and/or interrupt recording to eliminate the commercials. The detection of programme type is effected on the basis of code signals transmitted together with the programmes.

FIG1



1 / 4  
FIG1

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2 / 4  
FIG2

(a)

Priority :	
1. movie	2. show
3. news	4. drama

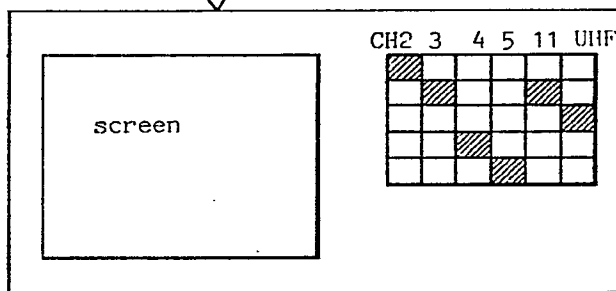
(b)

If a VTR has been recording  
the movie, the other program  
has not been recording.

(c)

CH2 : movie
CH3 : news
CH4 : show
CH5 : commercial
CH11: news
UHF : education

(d)

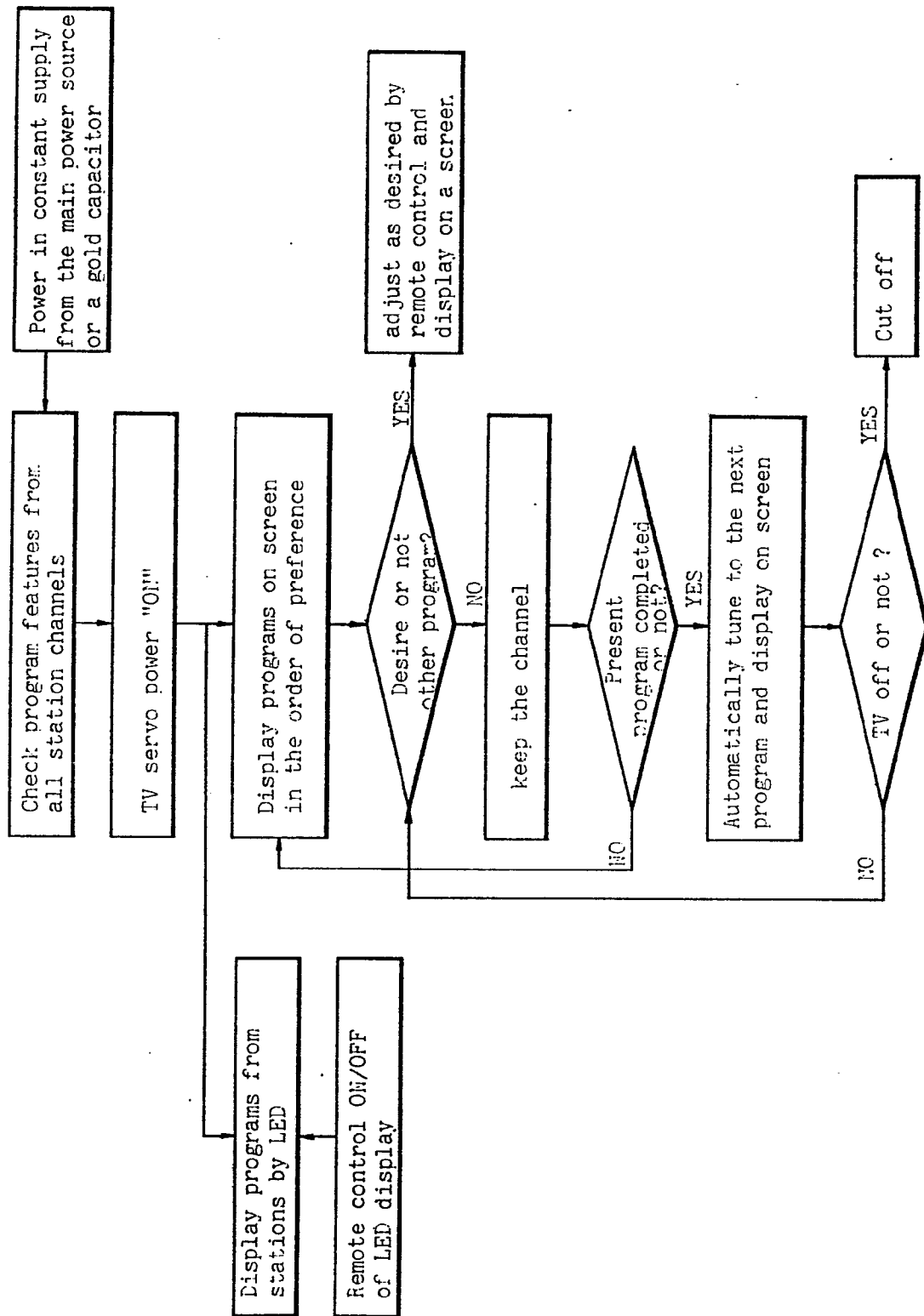


1 ROW : movie  
2 ROW : news  
3 ROW : drama or education  
4 ROW : show  
5 ROW : commercial

3/4

FIG3

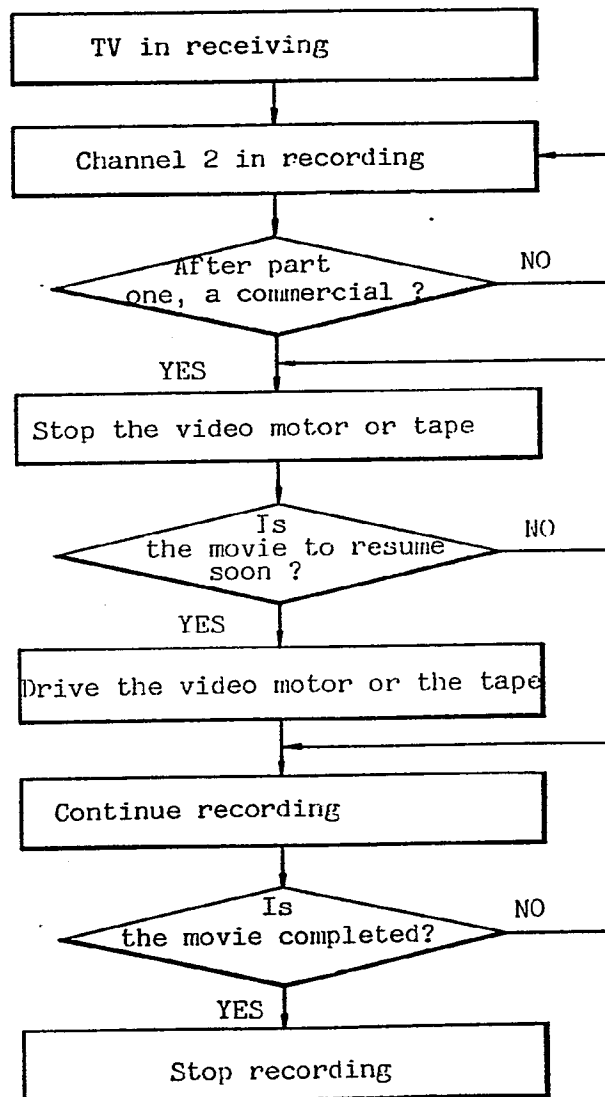
(a) Receiving



4/4

FIG 3

(b) . Recording



APPARATUS FOR CONTROLLING VIDEO OR AUDIO  
EQUIPMENT

5 The present invention relates to apparatus for  
controlling video or audio equipment such as a  
television (TV), radio, or video cassette recorder  
(VCR).

10 Some problems exist with conventional usage of  
TVs, radios and VCRs. Since the broadcast from only a  
single channel or station can normally be displayed on  
a TV set or heard from a radio, the user may miss a  
desired programme on another channel or station. In  
addition, when recording a long programme such as a  
movie on a VCR, intrusive commercial breaks are  
captured on the tape along with the desired programme.

15 According to the present invention, there is  
provided apparatus for controlling video or audio  
equipment, comprising:

20 detecting means operable to detect types of TV  
or radio programmes currently being broadcast on  
various channels or stations;

25 storage and selecting means operable to store  
preference information on one or more types of  
programme preferred by a user; and operable  
automatically to select a particular channel or station  
on the basis of the type of programme being broadcast,  
taking into account the preference information; and

control means operable to cause the video or  
audio equipment to receive said particular channel or  
station.

30 An embodiment of the present invention can  
find TV/radio broadcasting programmes from stations,  
indicate the available programmes on a TV screen or on  
display panel associated with a TV or radio, and  
automatically tune to the channel that is broadcasting  
35 a programme desired by the user.

An embodiment of the present invention can also economically control a VCR tape in a recording operation in such a way as to omit unwanted commercial broadcasting from the recording. The user's enjoyment of TV and radio broadcasts and of video recordings can therefore be improved.

More specifically, an embodiment of the present invention is operable to find programmes on air by their respective features and to arrange them in the order of user preference. Depending on the programme contents, the desired channel is automatically tuned for receiving or for recording on an audio or video tape. The tape can be controlled so as to omit unwanted signals (e.g commercials) from recording and to resume the recording after the unwanted signals are finished.

Preferably, apparatus embodying the present invention includes a display means for displaying information on the types of programmes currently being broadcast. This may comprise a display unit having a two-dimensional array of lights or other display elements, one dimension of the array representing channel number or station frequency, and the other representing programme type.

Reference will now be made by way of example, to the accompanying drawings in which:

Figure 1 is an overall block diagram of apparatus embodying the invention;

Figures 2(a) to (d) are descriptive representations of operations of a TV set employing the apparatus; and

Figures 3(a) and (b) are flow charts of operations of the apparatus.

Reference signs in the drawings indicate the following features:

1 is a channel signal detector, 2 a memory for program features, 3 a channel display circuit, 4 a display unit, 5 an auto-tuning circuit, and 6 a VCR recording control.

5           Figure 1 shows an example of apparatus according to the invention as applied to a TV and VCR. The apparatus comprises a circuit including a TV/radio broadcasting programme detector 1, an auto-tuner 5 for selection of channels and a tape control 6 for  
10           controlling recording operation of the VCR. The channel signal detector 1, which detects all the channel signal (programme) contents from broadcasting stations is connected to a high frequency amplifying circuit of the TV set and also to the memory 2 storing  
15           programme features (types) desired or favoured by the user and to a channel display circuit 3 for displaying channels. The circuit 3 further connects to a display unit 4 and to the memory 2, which further connects to the auto-tuning circuit 5 connecting to a local  
20           oscillator in the TV. The memory 2 also connects to the VCR recording control 6 to further connect with the VCR drive motor.

          The operation and effect of the invention will now be described in detail.

25           An antenna picks up radio waves on air from broadcasting stations, and the channel signal detector 1 finds all the types of programmes in the received waves on the basis of programme features (e.g., movies, drama, shows, commercials,...etc.).

30           The detection of the type of each programme is effected on the basis of predetermined code signals contained in the broadcast alongside the normal programme. The predetermined code signals are transmitted at least at the start of every programme  
35           segment or commercial break, and may be transmitted



continuously. The signals sent to the memory 2 from the detector 1 are compared with a list of programme preferences previously stored in the memory by the user to determine the priority order for tuning. The  
5 determined channel selection is applied to the auto-tuning circuit 5 as a control signal for the circuit 5, which in turn produces an output signal to drive the TV set's local oscillator, so as to effect auto-tuning to the channel carrying the most preferred programme  
10 currently available.

In addition, the output signals from the detector 1 are delivered through the channel display circuit 3 to the display unit 4, to give a visual  
15 indication of the selection of programmes currently on air as shown in Figure 2(d).

The display unit 4 may be provided in the form of a matrix of indicator lights built into the TV set, or in a separate unit; alternatively, a portion of the TV screen itself may be used to provide the display,  
20 with the display unit 4 acting to modify the normal driving signal delivered to the electron gun.

The output signals from the detector 1 are compared with the programme types stored as preferences in the memory 2 and a selection is made from the  
25 available programmes by supplying an appropriate signal from the auto-tune circuit 5 to the TV set local oscillator. This comparison and selection process is preferably performed whenever the detector 1 detects that the type of programme broadcast on the currently-  
30 selected channel has changed. On the other hand, it may be preferable not to change channels automatically as soon as a more preferred type of programme becomes available on another channel, before the programme being watched or recorded has finished. This can be  
35 left as an optional feature to be chosen or not chosen

by the user.

In the case of recording a programme using the VCR, the feature signal applied to the programme feature memory 2 via the line 7 from the detector 1 causes the memory 2 to produce an output control signal to the VCR record control 6, so as to drive the VCR drive motor to control the VCR tape. In this way, a programme of interest to the user can be recorded completely automatically.

An example of operation is as follows.

TABLE I

Channel 2	movie
Channel 3	news
Channel 4	show
Channel 5	commercials
Channel 11	news
UHF	education

Suppose that channel stations are broadcasting respective programmes of types as shown in the above Table I, including the appropriate identifying code signals as mentioned above, and that the priority order set by the user in the memory 2 is determined as in Table II.

TABLE II

Priority 1	movie
Priority 2	show
Priority 3	news
Priority 4	drama
Priority 5	:

In this case, when the TV set is switched on,

the control apparatus will select channel 2, since this is currently broadcasting a movie, and tune the TV set accordingly so that the user can watch the movie.

However, if the movie on channel 2 is interrupted by commercials the auto-tuner switches the received channel to Channel 4, so that a show programme can be watched by the user in place of the commercials. Then, if the movie is resumed after the completion of the commercials, the channel signal detector 1 detects this and the selected channel automatically returns to Channel 2 from Channel 4 to show the next part of the movie. After the movie is completed, the TV set is again automatically tuned to Channel 4 according to the priority order in the memory 2, so that the user can watch the show being broadcast on that channel.

Meanwhile, if a VCR has been recording the movie, the switching to Channel 4 would interrupt the recording only to resume it on tuning to Channel 2 again. Therefore, no tape is wasted and the movie is recorded without any gaps.

Figure 2 shows descriptive representations for operations of a TV set with the apparatus of the invention. The initial states (preferences) memorized in the memory 2 are shown in Figures 2(a) and (b) with the presently available broadcasts shown in Figure 2(c), the Figure 2(d) showing the outer appearance of the TV with the display unit 4.

Although in the above an example of the present invention has been described in relation to TVs and VCRs, the invention may also be diversely applied to other audio devices, such as radios and audio recording equipment. Radio broadcasts can be selected, and audio recordings from the radio can be controlled, in the same way as described above.

The present invention thus provides an

- 5 effective channel control for TVs by automatically tuning the channel to one showing a type of programme of interest to the user, and allows economic use of VCR tapes by preventing unnecessary recording of unwanted programme material such as commercials.

CLAIMS;

1. Apparatus for controlling video or audio equipment, comprising:

detecting means operable to detect types of TV or radio programmes currently being broadcast on various channels or stations;

storage and selecting means operable to store preference information on one or more types of programme preferred by a user, and operable automatically to select a particular channel or station on the basis of the type of programme being broadcast, taking into account the preference information; and

control means operable to cause the video or audio equipment to receive said particular channel or station.

2. Apparatus as claimed in claim 1, wherein the detecting means is operable to detect predetermined code signals broadcast together with the programmes and identifying the types of programmes.

3. Apparatus as claimed in claim 1 or 2, wherein, in use, the apparatus selects a new channel or station whenever there is a change in the type of programme being broadcast on the currently selected channel or station.

4. Apparatus as claimed in claim 1, 2 or 3, wherein said video or audio equipment includes recording equipment, and wherein the apparatus is operable to cause the recording equipment to begin recording said particular channel or station when selected by the storage and selecting means.

5. Apparatus as claimed in claim 4 wherein the apparatus is further operable to halt the recording being made by the recording equipment when the detecting means detects a change in the type of programme being broadcast on the selected channel or

station.

5           6.           Apparatus as claimed in any preceding claim,  
wherein one type of programme detectable by the  
detecting means is commercials, whereby the apparatus  
is operable to control the equipment so as to avoid  
receiving or recording commercials.

10           7.           Apparatus as claimed in claim 6, wherein in  
use, following a change in the selected channel or  
station when commercials are detected on the  
originally-selected channel or station, the originally-  
selected channel or station is restored when the  
commercials have ended.

15           8.           Apparatus as claimed in any preceding claim,  
further comprising:  
display means operable to display information  
from the detecting means on the types of programmes  
currently being broadcast.

20           9.           Apparatus as claimed in claim 8, wherein the  
display means includes a display unit having a two-  
dimensional array of display elements, one dimension of  
the array representing channel number or station  
frequency, and the other dimension representing  
programme type.

25           10.          Apparatus for controlling video or audio  
equipment, substantially as hereinbefore described with  
reference to the accompanying drawings.